

A Paradigm Shift in Electricity Rate Design

Fundamentals and Trends

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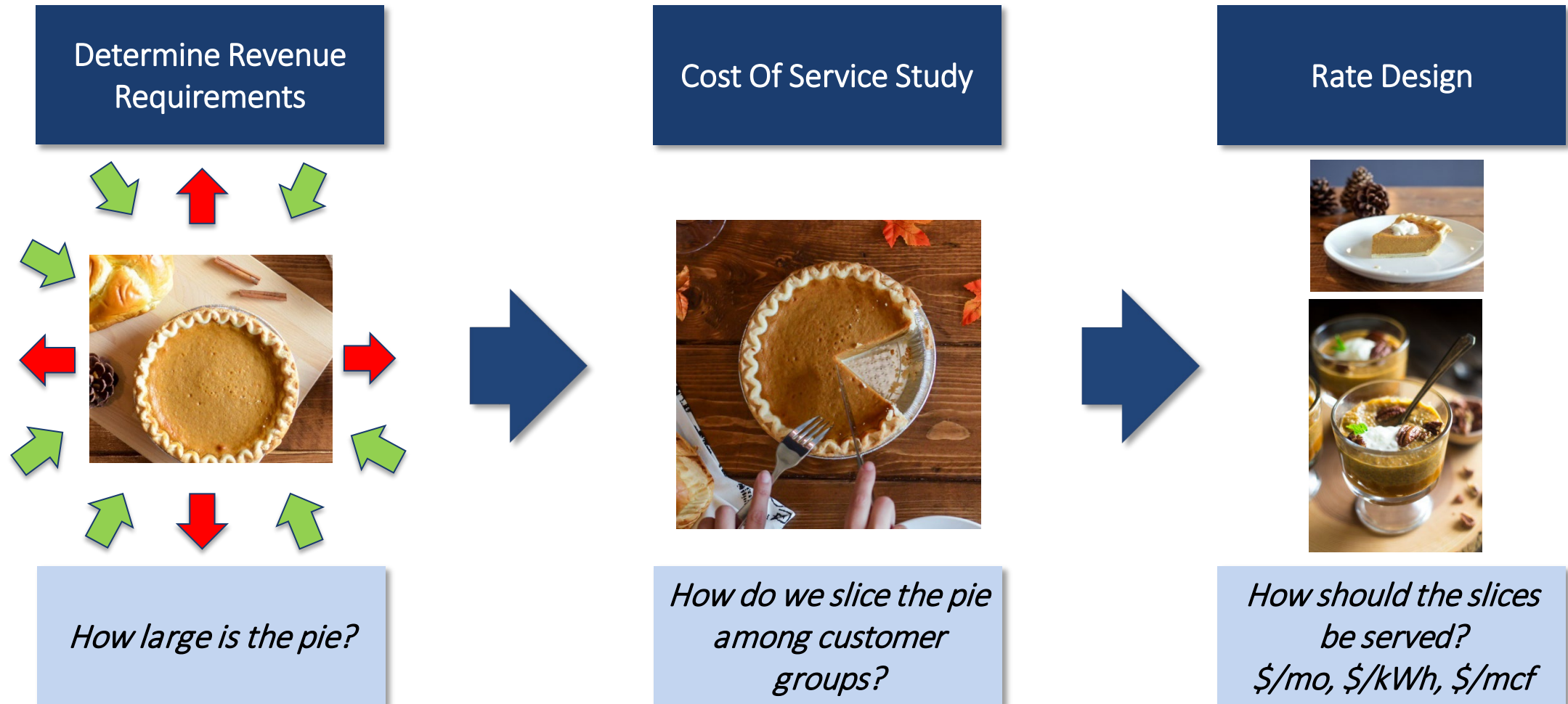
Electricity pricing has been a steady source of debate among practitioners since the beginning of the 20th century

The British economist D.J. Bolton stated the following in his 1938 publication, “Costs and Tariffs in Electricity Supply”

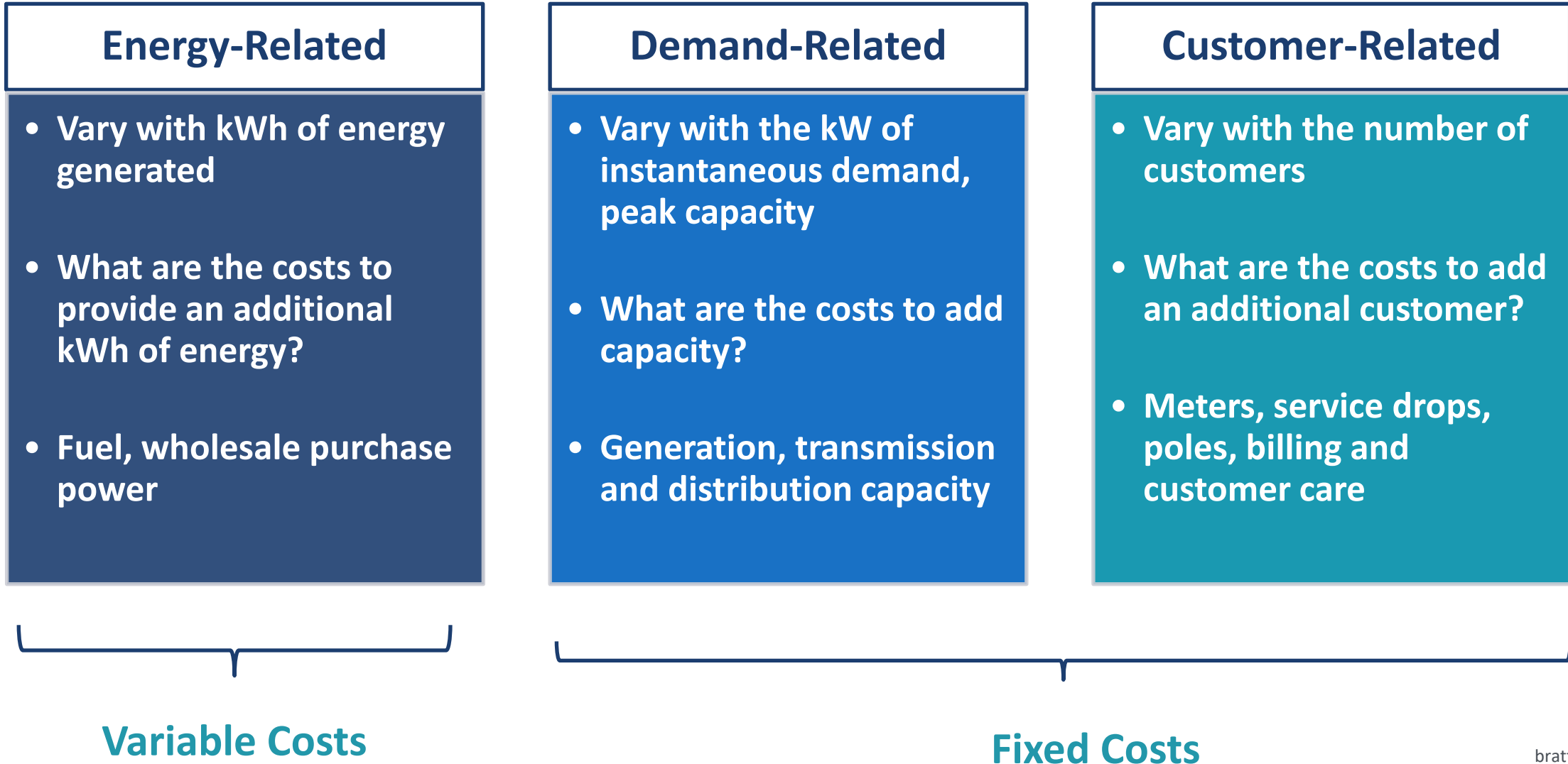
There's never been any lack of interest in the subject of electricity tariffs. Like all charges upon the consumer, they are an unfailing source of annoyance to those who pay, and an argument among those who levy them. There is general agreement that appropriate tariffs are essential to any rapid development of electricity supply and there is complete disagreement as to what constitutes an appropriate tariff

We are far into the 21st century, and this statement still rings true!

50,000 Foot View of Rate Setting Process



The utility cost structure has three primary components





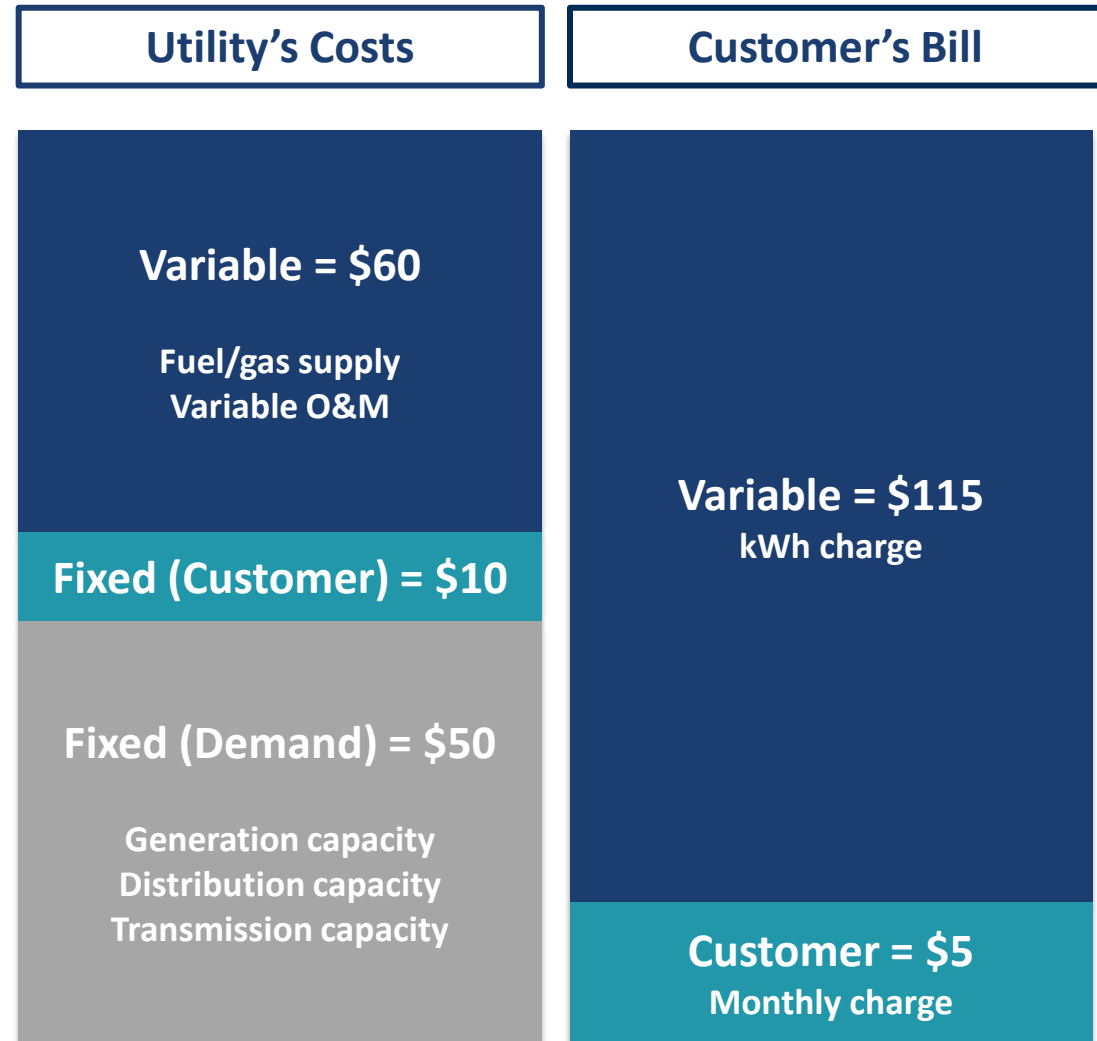
Misalignment between how utility costs are incurred and how they are recovered from customers

The typical residential customer's bill does not match the utility's underlying costs

In the example, the variable kWh charge recovers not only the \$60 of variable costs, but also \$55 of the fixed costs...

...but a utility does not avoid embedded/fixed costs when a consumer reduces its usage

This is problematic and is at the heart of many discussions in rate design and electricity policy



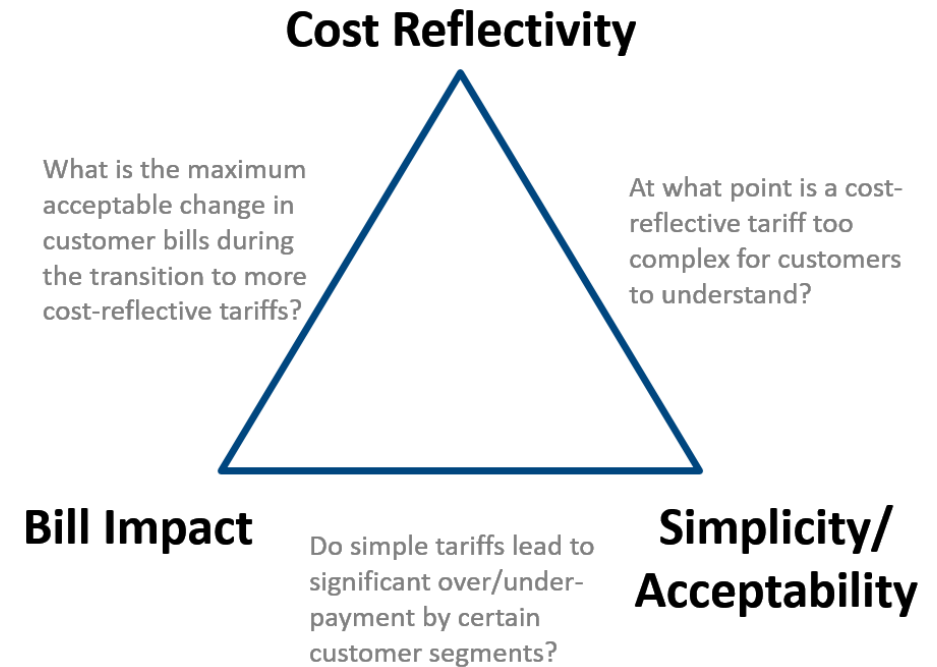
Primary Mission of Retail Pricing

First and foremost function of retail rates is to recover utility's revenue requirement in the most economically efficient and equitable fashion

At the same time, rates should reflect the structure of the costs incurred to serve them and lead to **efficient price signals** to:

- Encourage optimal consumption decisions;
- Lead to bill stability for customers and revenue stability for utilities; and
- Be easily understandable by customers

Rate designs are evaluated with respect to well known **rate design principles**



Current trends in residential rate design

Growing focus on deploying time-varying rates

- Drivers: Produce benefits from AMI deployment, integrate renewables
- Several US states moving to default TOU

Reforms to improve equity in rate design for customers with distributed generation

- Drivers: Growing adoption of DG, concerns about cost shift
- Gradual reform of net metering policies

Rates to facilitate positive economics for customers with electric vehicles/heating

- Drivers: Consistency with decarb goals, mitigating grid capacity constraints
- Key issue: Whether or not to provide end-use specific discounts through rates

Move toward rate choice

- Drivers: Customer base more engaged in and flexible with energy use
- Key to success: Meaningfully differentiated choices, sufficient number of options without overwhelming customers

Implications for providing rate choice

Potential advantages

- Improved customer satisfaction
- Economically efficient electricity consumption
- Achievement of policy goals
- Improved energy affordability

Potential challenges

- Revenue loss
- Customer confusion
- Bill increases for some customers

Should rates be used to incentivize certain technologies?

As a general matter, it is preferable to offer technology-neutral rates

- Cost-based rates still can be designed with a technology's operating characteristics in mind
- Policy goal of subsidizing technology more efficiently achieved through other means

However, there could be some conditions that support end-use specific rates

- If demonstrated that customers with certain technology have different cost to serve
- If there is a legacy end-use rate, then a gradual transition to cost-based rates may be needed
- When there is a critical, urgent policy goal, temporary rate discounts have been used by some utilities/jurisdictions. But it's a slippery slope.